

PATENT SPECIFICATION

1,062,610

DRAWINGS ATTACHED.

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Int. Cl.:—F 16 d /B 21 d, j.



COMPLETE SPECIFICATION.

Improvements relating to the Attachment of Components to Shafts.

10 We, STONE MANGANESE MARINE LIMITED,
of Anchor and Hope Lane, London, S.E.7,
a Company incorporated under the laws of
Great Britain, do hereby declare the in-
vention, for which we pray that a patent
may be granted to us, and the method by
which it is to be performed, to be par-
ticularly described in and by the following
statement:—

15 This invention concerns improvements re-
lating to the attachment of components to
shafts, especially but not exclusively marine
propellers to propeller shafts. Another
especially useful application is the attach-
ment of drive pulleys to shafts. A particu-
lar object of the invention is to achieve an
effective and reliable interference fit for the
purpose of attaining a high torque-carrying
capacity without the use of mechanical
attachment or locking means.

20 According to the invention, interference
between a component with a tapered or
parallel hole and a shaft of complementary
shape is produced by swelling the shaft
within the said hole with the assistance of
means comprising a pin which has a slight
taper, suitably between 1 in 30 and 1 in 70,
and is fitted into an axial bore having a like
taper and extending in the shaft for sub-
stantially the length of fit between the said
hole and shaft, the pin being provided at
its outer end with a fine thread, which is
engaged in a complementary thread in the
bore, and being also provided with passages
35 which communicate with grooves at the cir-
cumferential surface of the pin and through
which hydraulic medium at high pressure
is admitted at the same time as the pin is
screwed into the bore. As the pin is
40 screwed in simultaneously with the supply
of the said medium, the latter is sealed with-
in the bore to swell the shaft within the

hole in the component and give the re-
quired interference. When this interfer-
ence, which can readily be determined by
measurement in known manner, has been
achieved, the hydraulic pressure is relieved,
leaving the component attached to the shaft
with a predetermined interference fit. To
remove the component from the shaft, hy-
draulic pressure is applied through the pin
and the pin is screwed out. The compon-
ent can then be withdrawn from the shaft.
Both for attachment and removal, the use
of the hydraulic pressure ensures that only
a relatively small moment is required for
turning the pin and a conventional fine
thread can be employed.

One manner of carrying the invention into
effect will now be more fully described by
way of example and with reference to the
accompanying drawing, which is a longi-
tudinal section through part of a shaft 1
and a component 2 attached thereto. The
component 2 might be the hub or boss of
a marine propeller, in which case the shaft
1 would be the propeller shaft. The com-
ponent 2 might alternatively be the hub of
a belt or chain pulley and the shaft 1 a
driving or driven transmission shaft. The
hub 2 is mounted with a tapered hole 3
on a tapered end portion 4 of the shaft 1.

Inside the tapered portion 4, the shaft 1
has a tapered axial bore 5 which accom-
modates a pin 6 having the same taper. A
good machine finish should be provided on
the bore 5 and pin 6. As illustrated, the
tapered bore 5 runs into a cylindrical bore
7 extending through the shaft 1, but it may
have a closed, radiused, inner end. At its
outer end, the pin 6 is provided with a fine
thread 8 which is screwed into a comple-
mentary thread in a recess 9 at the outer
end of the bore 5. For turning the pin 6,

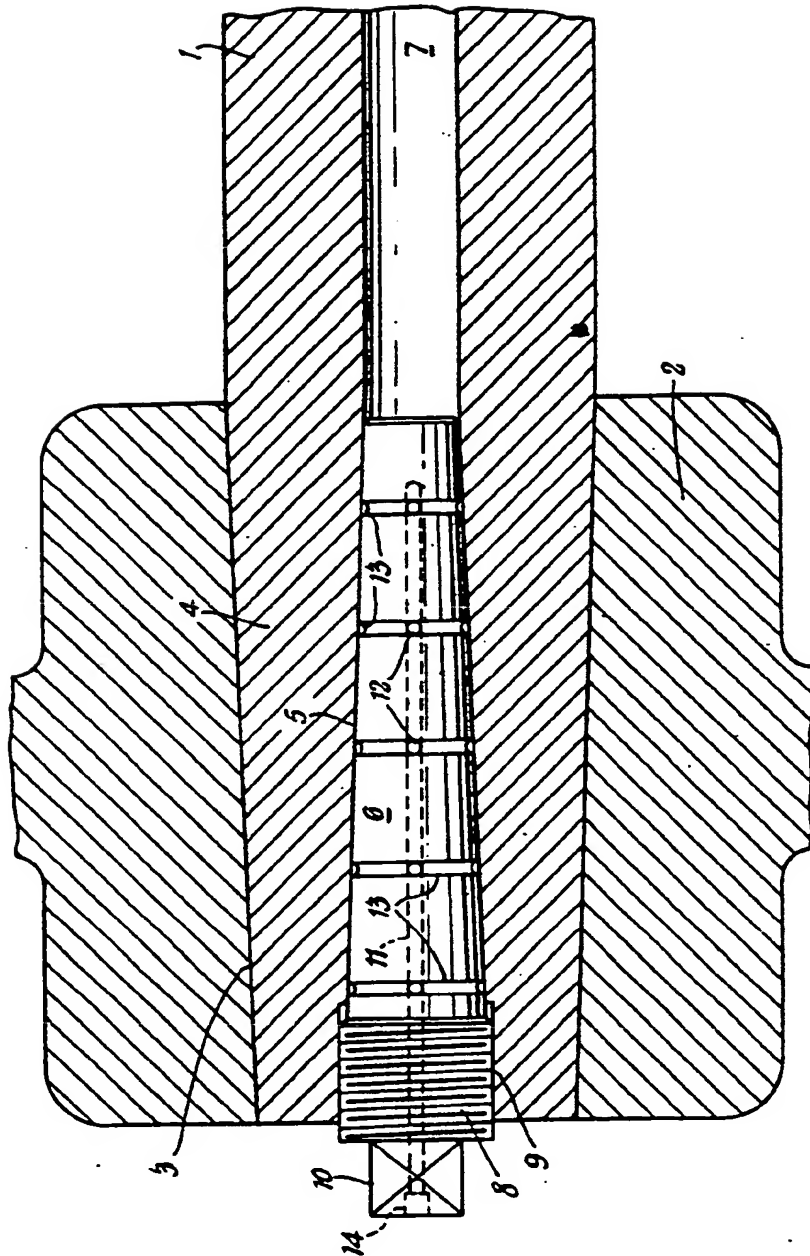
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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of
the Original on a reduced scale*



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